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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Ichiro Kataoka

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EXAMINER

BARTON, JEFFREY THOMAS

ART UNIT

PAPER NUMBER

1795

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/731,476	Applicant(s) KATAOKA ET AL.	
	Examiner Jeffrey T. Barton	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 August 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-5 and 7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-5 and 7 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12 August 2008 has been entered.

Status of Rejections Pending Since the Office Action of 12 May 2008

2. All previous rejections are withdrawn due to Applicant's amendment.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-5 and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In claim 1 at lines 17-18, "a tabular member made of a metal plate" is recited although "a tabular member made of a metal plate" is recited earlier in the claim at lines 6-7. It is unclear whether this is the same tabular member or a different tabular member. Claims 2-5 and 7 depend from claim 1, and are rejected on the same grounds.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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8. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Plessing et al (US 6,369,316) in view of Yoshino et al (US 5,993,582) and Chikaki et al. (6,149,757)

Plessing discloses a photovoltaic module and method of producing the same. The module is shown in figure 1 with the method in figure 2.

Regarding claim 1, Plessing shows the method of producing in figure 2. The method comprises the steps of mounting the body to be laminated, 1, on a tabular member, 15; carrying the body to be laminated along with the tabular member onto the mounting board, 21 (belt 16 does the carrying); heat-bonding the body to be laminated by pressing using the pressing means, 17 including 18, 19 and 20; carrying out the body to be laminated along with the tabular member from the mounting board after parting the pressing means from the body to be laminated (16 carries out); and separating the body to be laminated from the tabular member (separation section 27, see column 6, lines 45-50).

Regarding claims 2 and 3, Plessing discloses the use of release sheets, or separating films between the module and the tabular member (column 6, lines 15-18). It is the position of the examiner that the separating films and tabular member do not have perfectly flat surfaces down to the atomic level and thus the surfaces have some measure of irregularity or an irregular form on the surfaces as required in the claims. As applicant has not defined the specificities of these irregular forms, the reference is deemed to be anticipatory for the claims.

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Plessing does not explicitly disclose that tabular member 15 is made of a metal plate, nor does Plessing disclose cooling means that cool the pressing means.

Regarding claim 4, Plessing does not specifically require a specific mounting board temperature.

Yoshino et al is relied upon for teaching a conventional lamination apparatus used for vacuum lamination of solar cells. (Column 1, lines 8-14) The system of Yoshino et al uses a carrier member (Mounting table/base plate 101, 602, 801) that is a metallic plate, which provides the advantages of sufficient physical strength for the lamination processes and low calorific capacity for quick heating and cooling. Steel is preferred for its cost and weight/rigidity balance. (Column 7, lines 7-24; Column 15, lines 33-50) As with Plessing's member 15, the materials to be laminated are stacked upon this base plate. (Column 16, line 46 - Column 17, line 38)

Chikaki teaches a laminating apparatus as shown in figure 1. The apparatus includes a heating stage, 10, that can include a water cooled pipe, a cooling means (column 4, lines 44-48).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Plessing by specifically using a steel plate for carrier member 15, as taught by Yoshino et al, because Yoshino et al teach that steel has excellent physical strength, low calorific capacity for quick heating and cooling, and low cost, which a skilled artisan would have recognized as advantageous in carrier plates in lamination systems. Furthermore, Plessing's silence concerning the material used to make carrier member 15 would have led a skilled artisan to turn to related prior

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art vacuum lamination systems, such as that of Yoshino et al, to select an appropriate material. Note also that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

It also would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the configuration of the heating stage, including the water cooled pipe, of Chikaki within the method of Plessing because the heater of Chikaki accurately controls the heating temperature by the inclusion of the water cooled pipe (Chikaki column 4, lines 44-48). In the method of Plessing, the heating plate, 21, along with parts 19, 20 and 18 all comprise the pressing means as it is their combined forces that press on the laminated body. Therefore, the use of a water cooled pipe within the heating plate, 21, of Plessing cools the pressing means by cooling means as required by the claim. Because Plessing, Yoshino et al, and Chikaki are concerned with laminating solar modules, one would have a reasonable expectation of success from the combination.

Regarding the limitations "wherein the pressing means is cooled by cooling means after carrying out the body" and "wherein another body to be laminated is carried in along with a tabular member made of a metal plate onto the mounting board after cooling the pressing means", these limitations are deemed to be obvious within the method taught by the combined art because:

- (a) it would have been obvious to carry out the lamination procedure of Plessing repeatedly to form numerous laminated modules. This is suggested by Plessing

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in that the carrier plates are sent back to the loading station after the completion of the lamination of a module stack. (Column 6, lines 46-48) The only reason for doing this is to repeat the procedure in order to produce multiple laminated module stacks. Clearly, Plessing intends that numerous modules will be made in the lamination system disclosed (Plural modules disclosed also at Column 7, lines 24-26); and

(b) it would have been obvious to use the cooling means taught by Chikaki et al to cool the pressing means at any point that the temperature of the pressing means exceeded the desired temperature. This is obviously the nature of the temperature control taught by Chikaki et al. (Column 4, lines 44-48)

From this, it follows that the cooling step that is obvious from the teachings of Chikaki et al could obviously be performed in the middle of a series of repeated laminations (i.e. after one, several, or several hundred laminated module stacks have been carried out of the laminator 17 of Plessing), because the cooling means will obviously be employed at any point that the temperature of the pressing means is too high. In addition, after such cooling takes place, there obviously could be another one, several, or several hundred bodies introduced on a tabular member for lamination in laminator 17 of Plessing.

Regarding claim 4, the choice of specific lamination temperature is dependent on the specific application i.e. the specific lamination system, the item to laminated, and optimization of the lamination process. It would be obvious to one skilled in the art to make such a determination of operating temperature based on the specific

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application/optimization. Absent any unexpected results, the choice of the specific temperature as within the claim would be obvious for the method taught by the prior art.

9. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Plessing, Yoshino et al, and Chikaki et al as applied to claims 1-4 above, and further in view of Yamada et al (U.S. 6,127,622).

Plessing, Yoshino et al, and Chikaki et al are relied upon for the reasons given above in addressing claims 1-4.

None among Plessing, Yoshino et al, and Chikaki et al require a specific organic peroxide crosslinking agent.

Yamada teaches a laminated solar cell module as shown in figure 5. Yamada teaches the use of an encapsulating foam made of EVA for example (column 7, paragraph 4) and a crosslinking agent for the encapsulating foam made of an organic peroxide that has a 1-hour half-life temperature of between 100 and 170 °C (column 8, last paragraph).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the crosslinking agent of Yamada within the method of Plessing, Yoshino et al, and Chikaki et al, because the crosslinking agent improves the heat resistance and bond strength of the photovoltaic module (Yamada column 8, paragraph 7). It would have been further obvious to one of ordinary skill in the art at the time the invention was made to choose the specific half-life temperature of the claim because Yamada teaches that the crosslinking agent can have a 1-hour half-life

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temperature range that includes the claimed range. Absent any unexpected results, the selection of this portion of the range would be obvious for the combination. Because Yamada, Plessing, Yoshino et al, and Chikaki et al are concerned with solar cell modules, one would have a reasonable expectation of success from the combination. Thus the combination meets the claim.

10. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Plessing, Yoshino et al, and Chikaki et al as applied to claims 1-4 above, and further in view of Taylor. (US 4,426,633)

Plessing, Yoshino et al, and Chikaki et al are relied upon for the reasons given above in addressing claims 1-4.

None among Plessing, Yoshino et al, and Chikaki et al explicitly teach a material used for the separating films used to prevent adhesion of the laminated module to the carrier plate.

Taylor is relied upon for teaching known release films used in lamination methods to prevent adhesion of the laminated product to the lamination apparatus. Taylor teaches the use of glass-fiber reinforced PTFE as a release sheet in a lamination process. (Column 6, lines 8-45)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the method of Plessing and Yoshino et al by specifically selecting glass fiber/PTFE release sheets as the separating films (Plessing, Column 6, lines 15-17), as taught by Taylor, because Taylor teaches that glass fiber/PTFE sheets

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are effective in preventing adhesion of the laminated products to the apparatus.

(Column 6, lines 8-45) Because Taylor, Yoshino et al, and Plessing are all concerned with laminating systems and methods, a skilled artisan would have had a reasonable expectation of success from this combination. Furthermore, Plessing's silence concerning the material used to make the separating films would have led a skilled artisan to turn to related prior art release films, such as those of Taylor, to select an appropriate material. Note also that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Response to Arguments

11. Applicant's arguments filed 12 August 2008 have been fully considered but they are not persuasive.

Applicant argues that none of the prior art of record disclose or suggest the newly claimed method steps. The Examiner respectfully disagrees for reasons described in detail in the rejection above, and maintains that the steps, broadly recited, are suggested by the teachings of the prior art.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Jeffrey T. Barton whose telephone number is (571)272-1307. The examiner can normally be reached on M-F 9:00AM - 5:30PM.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jeffrey T. Barton/
Art Unit 1795
24 October 2008